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Andrew Genser

Dated

9 October 2003

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24 SEP 2002

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1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office
Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference	444.79307/000		
2. Patent application number (The Patent Office will fill in this part)	0222185.1		24 SEP 2002
3. Full name, address and postcode of the or of each applicant (underline all surnames)	Forinnova AS Thormøhlensgate 55 N-5008 Bergen Norway		
Patents ADP number (if you know it)			
If the applicant is a corporate body, give country/state of incorporation	Norway		
4. Title of the invention	USE		
5. Name of your agent (if you have one)	Frank B. Dehn & Co.		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	179 Queen Victoria Street London EC4V 4EL		
Patents ADP number (if you know it)	166001		
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day / month / year)	
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	Yes		

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Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

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Description	4 /
Claim(s)	1 / DM
Abstract	-
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Priority documents	-
Translations of priority documents	-
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	-
Request for preliminary examination and search (Patents Form 9/77)	-
Request for substantive examination (Patents Form 10/77)	-
Any other documents (please specify)	-

11. I/We request the grant of a patent on the basis of this application.

Signature Frank B Dehn & Co Date 24th September 2002

12. Name and daytime telephone number of person to contact in the United Kingdom
Julian Cockbain
020 7206 0600

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Use

5 The present invention relates to improvements in
and relating to cooked food, in particular vegetables
which are fried, grilled or baked.

 In a publication by the Swedish National Food
Administration (see www.slv.se/engdefault.asp) it was
reported that many cooked foods, in particular fried,
10 grilled or baked foods, had surprisingly been found to
contain high levels of the toxic contaminant acrylamide.
No suggestion was made as to how the acrylamide context
of such foods could be reduced.

 We have now surprisingly found that the acrylamide
15 content of cooked foods can be reduced by treatment of
the food prior to cooking with lactic acid generating
microorganisms and/or with acid.

 Thus viewed from one aspect the invention provides
the use of a lactic acid producing microorganism for the
20 treatment of a food material to reduce acrylamide
production in subsequent cooking thereof.

 Lactic acid producing microorganisms are well known
and examples include lactic acid bacteria such as
Bifidobacterium sp., Brevibacterium sp., Lactobacillus
25 sp., Lactococcus sp., Leuconostoc sp., Micrococcus sp.,
Oenococcus sp., Pediococcus sp., and Streptococcus sp.
Lactobacilli are especially preferred for use according
to the invention, in particular Lactobacillus plantarum
strains NCDO 1752 and NCDO 1193 (available from the
30 National Collection of Food Bacteria).

 The treatment with a lactic acid producing
microorganism according to the invention preferably
involves incubation in an aqueous medium for up to 7
days, e.g. 30 minutes to 24 hours, especially 1 to 6
35 hours.

 Viewed from a further aspect the invention provides
the use of a physiologically acceptable acid for the

treatment of a food material to reduce acrylamide production in subsequent cooking thereof.

The physiologically tolerable acid used according to the invention may be any acid acceptable for use in foodstuffs, e.g. organic acids, such as citric, malic, acetic, maleic, tartaric, succinic and lactic acids or inorganic acids such as hydrochloric, sulphuric and phosphoric acids and sulphur dioxide. The use of citric and hydrochloric acids is especially preferred. The acid is preferably used in a quantity and strength sufficient to reduce the surface pH of the food material treated to 1 to 5.5, preferably 3 to 5, especially about 4. Following acid treatment, the food material is preferably stored for up to 7 days (e.g. 30 minutes to 24 hours, especially 1 to 6 hours before cooking or freezing.

Following treatment with the acid and/or the lactic acid producing microorganism, the food material may be cooked using cooking techniques that expose the material to temperatures above 150°C, e.g. by baking, grilling or frying.

Before such high temperature cooking, it is desirable to rinse the treated food material with water.

The cooking may be one stage of a multi stage (e.g. two stage) cooking procedure. Thus the technique of the invention is especially applicable to food materials which are treated according to the invention, partially cooked, transported and/or stored, then cooked again.

The food material treated according to the invention may be any carbohydrate-containing food material but especially preferably is a plant or plant-derived material, e.g. a vegetable or cereal, in particular a root vegetable or a tuber (e.g. potato). Especially preferably the food material is potato, yam, onion, carrot, swede, turnip or parsnip. Such food materials are preferably processed (e.g. peeled, diced, sliced, chipped or chopped) prior to treatment according

to the invention.

The invention is especially applicable for the production of french-fried potatoes, in particular so-called oven-ready french-fried potatoes which are
5 provided to the consumer in part-cooked form for baking prior to serving, as well as to the production of chopped ready-to-fry potatoes (e.g. of the type produced for deep frying in restaurants).

Thus viewed from a further aspect the invention
10 provides a process for the preparation of ready to cook (e.g. oven-ready or ready to fry) french fried potatoes which process comprises chopping potatoes, fermenting the chopped potatoes with a lactic acid producing microorganism, frying the fermented chopped potatoes,
15 and optionally loading the fried fermented chopped potatoes in a container, and optionally sealing the container.

Viewed from a still further aspect the invention provides a process for the preparation of ready to cook
20 (e.g. oven-ready or ready to fry) french fried potatoes which process comprises chopping potatoes, treating the chopped potatoes with a physiologically acceptable acid, frying the acid treated potatoes, and optionally loading the fried potatoes into a container, and optionally
25 sealing the container.

The container used in these processes will typically be a plastic bag, paper carton or bag or other container conventionally used for storage and transport of ready to cook french fries.

30 Viewed from a still further aspect the invention thus also provides a container containing ready to cook (e.g. oven-ready or ready to fry) french fried potatoes produced by frying chopped potatoes pre treated with a lactic acid producing microorganism and/or with a
35 physiologically acceptable acid.

The potatoes treated according to the invention are preferably of a variety selected from Maris Piper, Beate

or Russet, especially Maris Piper. Especially preferably the potatoes are selected from varieties having a reducing sugar content of less than 1.5% wt, particularly less than 1.0% wt.

5 Besides being useful in the production of french-fried potatoes, the invention is also especially applicable in the production of potato crisps (also known in America as potato chips). In this regard, the acid and/or microorganism treatment is preferably
10 effected on the sliced potato prior to frying.

 The invention is also applicable to grain, i.e. cereal, products, e.g. breads, biscuits (known in America as cookies), and in particular crisp breads. In this aspect of the invention, the treatment according to
15 the invention may be effected using lactic acid bacteria in the production of the dough and/or by acid treatment (e.g. treatment with sulphur dioxide or hydrogen chloride) of the flour.

Claims:

1. The use of a lactic acid producing microorganism
for the treatment of a food material to reduce
5 acrylamide production in subsequent cooking thereof.

2. The use of a physiologically acceptable acid for
the treatment of a food material to reduce acrylamide
production in subsequent cooking thereof.
10

3. A process for the preparation of ready to cook
french fried potatoes which process comprises chopping
potatoes, fermenting the chopped potatoes with a lactic
acid producing microorganism, frying the fermented
15 chopped potatoes, and optionally loading the fried
fermented chopped potatoes into a container.

4. A process for the preparation of ready to cook
french fried potatoes which process comprises chopping
20 potatoes, treating the chopped potatoes with a
physiologically acceptable acid, frying the acid treated
potatoes, and optionally loading the fried potatoes into
a container.

25 5. A container, preferably a sealed container,
containing oven-ready french fried potatoes produced by
frying chopped potatoes pre treated with a lactic acid
producing microorganism and/or a physiologically
acceptable acid.

30

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